## DETAILED ACTION

### Response to Amendment

1. As stated in an interview with the applicant on 10/01/2009, the Office Action dated 06/22/2009 is withdrawn.

2. Receipt is acknowledged of applicant's amendment filed 04/17/2009. Claims 15, 17, and 25-34 have been cancelled by applicant. Claims 1-14, 16, and 18-24 are pending and an action on the merits is as follows.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6-7, 11-14, 16 and 35 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888).

**Regarding Claims 1-2,** Yorikatsu et al. (Yorikatsu, hereafter), teaches a method for producing a photo-cathode (Column 1, lines 29-31)for emitting a photoelectron corresponding to incident light or a secondary-electron emitting surface (Column 12, lines 25-30) for emitting secondary electrons corresponding to an incident electron, the method comprising: an oxidizer (column 1, lines 35-38) with an alkali metal ion as a counter cation; and a reducer (column 1, lines 40-41) for initiating a redox reaction with

the oxidizer at a predetermined temperature to reduce the alkali metal ion (Column 4, lines 13-15); setting the alkali metal generating device in a space (Column 12, lines 20-25) (prior art teaches coating the lateral surface of the bulb) continuing an inner space of the container; depressurizing the space where the alkali metal generating device is set and the inner space of the container by a predetermined vacuum (Column 12, lines 30-35) (*Examiner note: prior art reference teaches the alkali coating on the inner surface and the inner portion of the bulb being evacuated).*; heating the alkali metal generating device set in the depressurized space to generate an alkali metal vapor in the depressurized space (Column 12, lines 35-40) ; guiding the alkali metal vapor generated from the heated alkali metal generating device while controlling a temperature of the container to an area the layer is formed (Column 12, lines 35-40) where the layer is formed. (*examiner note: prior art teaches that as thin layer of antimony is deposited and then heating the alkali agent to deposit on top of the anitmony, thus being guided to form layer limitation has been met)*

Yorikatsu is silent regarding an oxidizer comprising at least one vanadate with an alkali metal ion as a counter cation (claim 1); wherein the vanadate is expressed by a chemical formula RVO.sub.3, where R is at least one metal element selected from the group consisting of Na, K, Rb, and Cs (cla).

In the same field of endeavor of discharge tubes and generating agents, Van der Marel et al teaches an oxidizer of (Column 3, lines 30-33) using the compounds, platinum titanium, vanadium and tungsten along with Cs which is an alkali earth metal. Van der Marel et al. does not explicitly teach one vanadate nor the expression wherein

the vanadate is expressed by a chemical formula $RVO_3$, where R is at least one metal element selected from the group consisting of Na, K, Rb, and Cs. Rather in the Column sited Van der Marel et al. recites how to make a compound having both compounds without reciting chemical formulas in order to provide a compound which is electrically conductive and does not react with alkaline earth metals at higher temperatures (Column 3, lines 30-35).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the alkali generating agent of Yorikatsu wherein a vanadate and an alkali metal ion as a counter cation; wherein the vanadate is expressed by a chemical formula RVO.sub.3, where R is at least one metal element selected from the group consisting of Na, K, Rb, and Cs in order to provide a compound which is electrically conductive and does not react with alkaline earth metals at higher temperatures as taught by Van der Marel et al .

**Regarding claim 3,** Yorikatsu teaches wherein the reducer is at least one selected from the group consisting of Si, Zr, Ti, and Al (Column 1, lines 40-41).

**Regarding claim 4,** Yorikatsu teaches the alkali metal generating agent being of a powder form. (Column 4, lines 47-50).

**Regarding claim 6,** Yorikatsu teaches (Figure 9) a case housing the alkali generating agent ((10) and comprising an alkali metal generating agent according to claim 1 **(see rejection claim 1);** and a discharge port (12, gaps) provided in the case (10) and adapted for discharging a the alkali vapor from an interior space of the case (10) housing the supply source, toward the exterior of the case (10).

**Regarding claim 7,** Yorikatsu teaches wherein the case is made of a metal (Column 12, lines 3-5)

**Regarding claim 11,** Yorikatsu teaches comprising a glass ampule housing the entire case (Column 12, lines 30-33).

**Regarding claim 12,** Yorikatsu teaches a heating device for initiating the redox reaction of the alkali metal generating agent to generate the vapor of the alkali metal.(Column 12, lines 24-28) *(Examiner note: Prior art reference teaches two lead wires extend from the generators to provide heating for the agent.)*

**Regarding claim 13,** Yorikatsu teaches wherein the heating device comprises a high-frequency supply for heating the alkali metal generating agent by high-frequency heating (Column 1, lines 45-50)

**Regarding claim 14,** Yorikatsu teaches A photo-cathode (Column 1, lines 25-30) *(Examiner note : Photoelectric tube of prior art reference is a photocathode)* for emitting a photoelectron corresponding to incident light, the photo-cathode comprising the alkali metal generated from by a method of claim 1 **(see rejection claim 1).**

**Regarding claim 16,** Yorikatsu teaches a secondary-electron emitting surface for emitting secondary electrons (Column 12, lines 25-30)corresponding to an incident electron, said secondary-electron emitting surface comprising the alkali metal generated from an alkali metal generated agent according a method of claim 1 **(see rejection claim 1).**

**Regarding claim 35,** Yorikatsu teaches, wherein the space (face plate Column 12, lines 11-15), in which the alkali metal generating device is set, constitutes part of the inner space of the container ( column 12, lines 25-30) *(examiner note: face-plate fitted to inner space curved portion of bulb)*

5. Claims 5 and 23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888)as applied to claim 1 and in further view of Suzuki (Japanese Patent application 55-078436).

**Regarding claim 5** Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent set forth above (see claim 1). Yorikatsu as modified by Van der Marel et al. is silent regarding the alkali metal generating agent being formed in a pellet form having a predetermined shape (claims 5) by compression molding.

In the same field of endeavor of alkali generating agents and discharge tubes Suzuki teaches the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding (Page 5, lines 3-5) in order to provide a device so that it can be packed into a container, and be thoroughly degassed.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the alkali generating agent of Yorikatsu wherein the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding in order to provide a device so that it can be packed into a container, and be thoroughly degassed as taught by Suzuki.

**Regarding claim 23,** Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent set forth above (see claim 1 and 16). Yorikatsu as modified by Van der Marel et al. is silent regarding electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface.

In the same field of endeavor of alkali agents and photosensitive devices, Suzuki teaches electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface (Page 5, lines 3-5) in order to provide a device with improved luminance through the secondary emission of electrons.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the alkali generating agent device of Yorikatsu wherein electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface in order to provide a device with improved luminance through the secondary emission of electrons as taught by Suzuki et al.

6. Claims 8-9 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888) as applied to claim 1 and in further view of Suyama et al. (US Patent 6,198,221 B1).

**Regarding claims 8-9,** Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent and device set forth above (see rejections claims 1 and 6). Yorikatsu teaches (Figure 3) wherein the case (10) is a hollow container of a

metal having apertures (12, gaps) at both ends thereof (Column 5, lines 5-10). Yorikatsu as modified by Van der Marel et al. is silent regarding the discharge port in a side face; and lid members of a metal covering the respective apertures at the both ends of the hollow container(claim 8) wherein the apertures at the both ends of the hollow container are hermetically closed in a state in which the hollow container secures an interior space for housing the alkali metal generating agent, and wherein the discharge port is provided in at least one of the both ends of the hollow container hermetically closed (claim 9).

In the same field of endeavor of photosensitive devices, Suyama et al. teaches (Figure 2) the discharge port (32) in a side face; and lid members (21,31) of covering of metal the respective apertures at the both ends of the hollow container(10); wherein the apertures at the both ends of the hollow container are hermetically closed in a state in which the hollow container secures an interior space for housing (4) the alkali metal generating agent, and wherein the discharge port (32) is provided in at least one of the both ends of the hollow container hermetically closed (32) in order to provide a device with a smaller size and easier assembly process (Column 1, lines 57-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the device of Yorikatsu the discharge port in a side face; and lid members of a metal covering the respective apertures at the both ends of the hollow container wherein the apertures at the both ends of the hollow container are hermetically closed in a state in which the hollow container secures an interior space for housing the alkali metal generating agent, and wherein the discharge port is provided in

at least one of the both ends of the hollow container hermetically closed in order to provide a device with a smaller size and easier assembly process as taught by Suyama et al.

7. Claim 10 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888)as applied to claim 1, in view of Suzuki (Japanese Patent application 55-078436) and in further view of Suyama et al. (US Patent 6,198,221 B1).

Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent and device set forth above (see rejections claims 1 and 6). Yorikatsu as modified by Van der Marel et al. is silent wherein the alkali metal generating agent is formed in a pellet form having a predetermined shape.

In the same field of endeavor of alkali generating agents and discharge tubes Suzuki teaches the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding (Page 5, lines 3-5) in order to provide a device so that it can be packed into a container, and be thoroughly degassed.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the alkali generating device of Yorikatsu wherein the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding in order to provide a device so that it can be packed into a container, and be thoroughly degassed as taught by Suzuki.

Yorikatsu as modified by Van der Marel et al. and Suzuki is silent regarding wherein the case is comprised of a closed-end container of a metal having a recess for

housing the alkali metal generating agent, and a lid member of a metal welded to the closed-end container in a state in which the lid member covers an aperture of the recess, and

wherein the discharge port of the case is formed in a non-welded portion between the closed-end container and the lid member.

In the same field of endeavor of photosensitive devices, Suyama et al. teaches (Figure 2) the case is comprised of a closed-end container (10)of a metal having a recess(40)for housing the alkali metal generating agent, and a lid (21)member of a metal welded to the closed-end container in a state in which the lid member (21) covers an aperture (not shown) of the recess (40), and wherein the discharge port (32) of the case (10) is formed in a non-welded portion between the closed-end(21) container and the lid member (31) in order to provide a device with a smaller size and easier assembly process.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the alkali generating device of Yorikatsu wherein the case is comprised of a closed-end container of a metal having a recess for housing the alkali metal generating agent, and a lid member of a metal welded to the closed-end container in a state in which the lid member covers an aperture of the recess, and wherein the discharge port of the case is formed in a non-welded portion between the closed-end container and the lid member in order to provide a device with a smaller size and easier assembly process as taught by Suyama et al.

8. Claims 18 and 20-21 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888) as applied to claim 1 and in further view of Bradley (U S. Patent 3,761,614)

**Regarding claims 18 and 20- 21,** Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent and device set forth above (see rejections claims 1 and 14). Yorikatsu as modified by Van der Marel et al. is silent regarding an electron tube comprising a photo-cathode (claim 18), or for collecting the photoelectron emitted from the photo-cathode and extracting the collected photoelectron as an electric current to the outside (claim 20); and wherein an image tube having at least a fluorescent screen for converting the photoelectron emitted from the photo-cathode, into light (Claim 21).

In the same field of endeavor of photo sensitive devices, Bradley teaches (Figure 1) an electron tube (1) comprising a photo-cathode (3), an anode (6) for collecting the photoelectron emitted from the photo-cathode (3) and extracting the collected photoelectron as an electric current to the outside (Column 3, lines 10-16); and wherein an image tube (1) having at least a fluorescent screen (9)for converting the photoelectron emitted from the photo-cathode (3) in to light in order to provide a device with improved lifespan of the luminous emitter and resolution in the picoseconds range (Column 1, line 35-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the device of Yorikatsu with an electron tube comprising a photo-cathode or an anode for collecting the photoelectron emitted from

the photo-cathode and extracting the collected photoelectron as an electric current to the outside and wherein an image tube having at least a fluorescent screen for converting the photoelectron emitted from the photo-cathode, into light in order to provide a device with improved lifespan of the luminous emitter and resolution in the picoseconds range as taught by Bradley.

**Regarding claim 22,** Yorikatsu as modified by Van der Marel et al. teaches the alkali metal generating agent and device set forth above (see rejections claims 1 and 14). Yorikatsu as modified by Van der Marel et al. is silent regarding a streak tube comprising: an accelerating electrode for accelerating the photoelectron emitted from the photo- cathode; a focusing electrode for focusing the photoelectron accelerated by the accelerating electrode; an anode having an aperture through which the photoelectron focused by the focusing electrode can pass; a deflecting electrode having a pair of electrode plates opposed to each other and adapted to be able to sweep the photoelectron having passed through the aperture provided in the anode, in a predetermined direction by a predetermined deflection voltage applied between the pair of electrode plates; and a fluorescent screen for converting the photoelectron deflected by the deflecting electrode, into light.

In the same field of endeavor of photo sensitive devices, Bradley teaches (Figure 1) an electron tube (1) comprising a streak tube (Column 1, lines 10-15) comprising: an accelerating electrode (4) for accelerating the photoelectron emitted from the photo-cathode (3); a focusing electrode (5) for focusing the photoelectron accelerated by the accelerating electrode (4); an anode (6) having an aperture through which the

photoelectron focused by the focusing electrode(5) can pass; a deflecting electrode (Figure 3, 80a and 80b) having a pair of electrode plates opposed to each other and adapted to be able to sweep the photoelectron having passed through the aperture provided in the anode (6), in a predetermined direction by a predetermined deflection voltage applied between the pair of electrode plates; and a fluorescent screen (9) for converting the photoelectron deflected by the deflecting electrode, into light (column 3, lines 25-30) in to light in order to provide a device with improved lifespan of the luminous emitter and resolution in the picoseconds range (Column 1, line 35-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the device of Yorikatsu with a streak tube comprising: an accelerating electrode for accelerating the photoelectron emitted from the photo-cathode; a focusing electrode for focusing the photoelectron accelerated by the accelerating electrode; an anode having an aperture through which the photoelectron focused by the focusing electrode can pass; a deflecting electrode having a pair of electrode plates opposed to each other and adapted to be able to sweep the photoelectron having passed through the aperture provided in the anode, in a predetermined direction by a predetermined deflection voltage applied between the pair of electrode plates; and a fluorescent screen for converting the photoelectron deflected by the deflecting electrode, into light in to light in order to provide a device with improved lifespan of the luminous emitter and resolution in the picoseconds range as taught by Bradley.

9. Claim 19 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888) as applied to claim 1 and in further view of Bradley (U S. Patent 3,761,614) as applied to claims 18, 20-22 and in further view of Suzuki (Japanese Patent application 55-078436).

**Regarding claim 19,** Yorikatsu as modified by Van der Marel et al. and Bradley, teaches the alkali metal generating agent set forth above (see claim 1 and 16). Bradley further teaches an anode (6) for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside (Column 3, lines 15-20).

Yorikatsu as modified by Van der Marel et al. is silent regarding electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface.

In the same field of endeavor of alkali agents and photosensitive devices, Suzuki teaches electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface (Page 5, lines 3-5) in order to provide a device with improved luminance through the secondary emission of electrons.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the alkali generating agent device of Yorikatsu wherein electron tube comprising an electron multiplying part comprised of one or more dynodes

each having a secondary-electron emitting surface in order to provide a device with improved luminance through the secondary emission of electrons as taught by Suzuki.

10. Claim 24 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Yorikatsu et al. (US Patent 3,658,713) in view of Van der Marel et al. (US 5,066,888)as applied to claim 1 in view of Suzuki (Japanese Patent application 55-078436) and in further view of Bradley (U S. Patent 3,761,614).

Yorikatsu as modified by Van der Marel et al. and Suzuki teaches the alkali metal generating device set forth above (see claim 1 and 23) . Suzuki is a photo-cathode (page 5, lines 5-8) for emitting a photoelectron corresponding to incident light, toward the electron multiplying part (page 5, lines 5-8).

Yorikatsu as modified by Van der Marel et al. and Suzuki is silent regarding an anode for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside.

In the same field of endeavor of alkali agents and photosensitive devices, Bradley teaches (Figure 1) an anode (6) for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside (Column 3, lines 15-20) in order to provide a device with more focused beams for a better image and accelerate electrons.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the alkali generating agent device of Yorikatsu wherein teaches an anode for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current

to the outside in order to provide a device with more focused beams for a better image and accelerate electrons as taught by Bradley.

***Response to Arguments***

11. Applicant's arguments with respect to claim1 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,925, 976 teaches an alkali metal generating agent containing vanadium.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracie Green whose telephone number is (571)270-3104. The examiner can normally be reached on Mon-Thurs 7:00am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Tracie Green/
Examiner, Art Unit 2879

/Sikha Roy/
Primary Examiner, Art Unit 2879